

CLAIMS

1. An electrode for use in a gallium nitride-based compound semiconductor light-emitting device comprising a light-permeable first layer which is in contact with a surface of a p-contact layer in a gallium nitride-based compound semiconductor light-emitting device and which is capable of providing ohmic contact, and a second layer which is in contact with a part of a surface of said p-contact layer, wherein said first layer comprises a metal, or an alloy of two or more metals, selected from a first group consisting of Au, Pt, Pd, Ni, Co, and Rh, and said second layer comprises an oxide of at least one metal selected from a second group consisting of Ni, Ti, Sn, Cr, Co, Zn, Cu, Mg, and In.
2. An electrode according to claim 1, wherein said first layer further comprises Ga.
3. An electrode according to claim 1, wherein a portion of the surface of said p-contact layer, which portion is not in contact with said second layer, includes an oxygen-lacking portion.
4. An electrode according to claim 1, which further comprises a third layer on a surface of said first layer opposite the side in contact with said p-contact layer, said third layer comprising an oxide of at least one metal selected from said second group.
5. An electrode according to claim 1, wherein said first layer comprises an alloy of Au with Ni and/or Co.
6. An electrode according to claim 1, wherein said second layer comprises an oxide of Ni and/or Co.
7. An electrode according to claim 4, wherein said third layer comprises an oxide of Ni and/or Co.
8. An electrode according to claim 1, wherein said second layer accounts for 0.01 to 90% of the surface of said p-contact layer.
9. An electrode according to claim 3, wherein said oxygen-lacking portion accounts for 10% or more of the surface of said p-contact layer.

10. An electrode according to claim 1, wherein said second layer has a thickness of 0.1 to 100 nm.

11. An electrode according to claim 5, wherein said alloy of said first layer has an Ni and/or Co content of 0.01 to 70 atom %.

12. An electrode according to claim 1, wherein said first layer has a thickness of 0.1 to 100 nm.

13. An electrode according to claim 4, wherein said third layer has a thickness of 1 nm or more.

14. An electrode according to claim 1, wherein said first layer has one or more pores in a portion thereof.

15. An electrode according to claim 1, wherein said first layer has a thick portion and a thin portion.

16. A gallium nitride-based compound semiconductor light-emitting device comprising an n-contact layer, a light-emitting layer and a p-contact layer formed on a substrate, which are composed of a gallium nitride-based compound semiconductor and which are sequentially stacked in the above order, and a negative electrode and a positive electrode which are formed on a surface of said n-contact layer and a surface of said p-contact layer, respectively, wherein said positive electrode is formed of an electrode according to any one of claims 1 to 15.